# DAV PUBLIC SCHOOL, IFFCO, PARADEEP
# CLASS-XII, SUB.MATHEMATICS
# CHAPER: MAXIMA AND MINIMA
# WORKSHEET(STANDARD)

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## (1 MARK MCQ TYPE)

1. The smallest value of the polynomial $x^3 - 18x^2 + 96x$ in [0, 9] is,
   (A) 126 (B) 0 (C) 135 (D) 160
2. If x is real , the minimum value of x2-8x+17 is
   (A) -1 (B) 0 (C) 1 (D) 2
3. At $x = \frac{5\pi}{6}, f(x) = 2sin3x + 3sin3x\ is$:
   (A) maximum (B) minimum
   (B) (C) zero (D) neither maximum nor minimum
4. The maximum value of $\left(\frac{1}{x}\right)^x$ is
   (A) e (B) $e^e$ (C) $e^{\frac{1}{e}}$ (D) $\left(\frac{1}{e}\right)^{\frac{1}{e}}$
5. $f(x) = x^x$ has a stationary point at
   (A) $x = e$ (B) $x = \frac{1}{e}$ (C) $x = 1$ (D) $x = \sqrt{e}$

## (1 MARK, ANSWER THE FOLLOWING TYPE)

6. The minimum value of sinx + cosx is …….
7. The point on the curve $x^2 = 2y$ which is nearest to the point (0,5) is ……..
8. For all values of $x$ , the minimum value of $\frac{1-x+x^2}{1=x+x^2}$ is ……..
9. A point c in the domain of a function f at which either f'(c)=0 or f is not differentiable is called a ……. of f.
10. The maximum value of f, if any, of the function $f(x) = (2x-1)^2 + 3$ is …….

## (2 MARKS QUESTIONS, SA TYPE QUESTIONS)

11. Find the maximum value of the following function on [-2,2]

$$f(x) = \begin{cases} 3x + 2, x \leq 0 \\ 2 - 3x, x > 0 \end{cases}$$

12. Find the extreme values of $x^2 - 5x + 6$
13. Find two numbers x and y whose sum is 15 such that $xy^2$ is maximum.
14. Examine the function f defined by $12f(x)=x^4$ for points of inflection.
15. Test the function f defined by $f(x) = 9x^{1/3}$ for inflection points.
16. Find the maximum value of the function $f(x) = \frac{1}{4x^2+2x+1}$
17. Prove that $f(x) = sinx + \sqrt{3}cosx$ has maximum value at $x = \frac{\pi}{6}$
18. Determine a rectangle of area 25 sq.units has the minimum perimeter.
19. Show that the function $f(x) = log|x|, \neq 0$ do not possess maxima or minima.
20. Find the Maximum and minimum values of the function
    $f(x) = |sin4x + 3|$